

WHAT IS CLAIMED IS:

1. A permanent magnet motor for driving a fan, comprising:

    a rotor including a permanent magnet;

    a stator including a stator core having a stator winding;

    a bearing for rotatably supporting a rotary shaft of said rotor; and

    a fan arranged on said rotor;

    wherein the fan is rotated while preventing, by a magnetic attraction force of the permanent magnet and the stator core, said rotor moving in a direction of thrust of the rotary shaft with a rotation of said fan; and

    wherein a surface magnetic flux density of the permanent magnet facing the stator core is lower at an end portion than at a central portion of the permanent magnet along the direction of thrust of the rotary shaft.

2. A permanent magnet motor according to Claim 1, wherein said permanent magnet motor is configured of magnetic materials having different magnetic characteristics so that the surface magnetic flux density of said permanent magnet facing said stator core is lower at the end portion than at the central portion of said permanent magnet along the direction of thrust of said rotary shaft.

3. A permanent magnet motor according to Claim

1, wherein a gap between said permanent magnet and said stator is wider at the end portion than at the central portion in the direction of thrust of said rotary shaft in such a manner that the surface magnetic flux density of said permanent magnet facing said stator core is lower at the end portion than at the central portion of said permanent magnet along the direction of thrust of said rotary shaft.

4. A permanent magnet motor according to Claim 1, wherein in case of a motor with an internal rotor, the end portion in the direction of thrust of the rotary shaft constituting an outer peripheral portion of the permanent magnet is chamfered or curved in such a manner that the surface magnetic flux density of said permanent magnet facing said stator core is lower at the end portion than at the central portion of said permanent magnet along the direction of thrust of said rotary shaft, and

wherein in case of a motor with an external rotor, the end portion in the direction of thrust of the rotary shaft constituting an inner peripheral portion of the permanent magnet is chamfered or curved in such a manner that the surface magnetic flux density of said permanent magnet facing said stator core is lower at the end portion than at the central portion of said permanent magnet along the direction of thrust of said rotary shaft.

5. A permanent magnet motor for driving a fan,

comprising:

a rotor including a permanent magnet;

a stator including a stator core having a stator winding;

a bearing for rotatably supporting a rotary shaft of said rotor; and

a fan arranged on said rotor;

wherein said fan is rotated while a movement of said rotor in a direction of thrust of the rotary shaft with a rotation of said fan is prevented by a magnetic attraction force of the permanent magnet and the stator core; and

wherein the permanent magnet has an opposed portion in opposed relation with an end surface of the stator core in a direction of thrust of the rotary shaft, and the magnetic attraction force of the opposed portion and the stator core prevents a movement of said rotor in the direction of thrust of the rotary shaft.

6. A permanent magnet motor for driving a fan, comprising:

a rotor including a permanent magnet;

a stator including a stator core having a stator winding;

a bearing for rotatably supporting a rotary shaft of said rotor; and

a fan arranged on said rotor;

wherein the fan is rotated while a movement of said rotor in a direction of thrust of the rotary

shaft with a rotation of the fan is prevented by a magnetic attraction force of the permanent magnet and the stator core; and

wherein a thickness of the stator core in the direction of thrust of the rotary shaft is greater than a thickness of the permanent magnet in the direction of thrust of the rotary shaft by an amount substantially equivalent to a displacement of said rotor moved by the thrust with a maximum rotational speed of said fan.

7. A permanent magnet motor according to Claim 1, wherein a magnetization yoke smaller in thickness than said permanent magnet in the direction of thrust of the rotary shaft is arranged or molded by a die for orientation molding at an end portion of said permanent magnet in such a manner that a surface magnetic flux density of said permanent magnet facing said stator core is lower at the end portion of said permanent magnet than at a central portion along the direction of thrust of said rotary shaft.

8. A permanent magnet motor according to Claim 1, wherein said fan is an axial flow fan.

9. A permanent magnet motor according to Claim 1, wherein said stator including said stator winding and said stator core is molded with synthetic resin.